Dual-Coding Theory and Empathy: How Animoto Can Animate English Language Arts Classrooms to the Core

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Twenty-first century learners must develop understandings that are quite different from those of the 20th century. Because students are reading, playing, messaging, and learning on the Internet now more than ever, I decided to explore the impact of a new online tool in a sixth grade Language Arts classroom. This relatively new online tool, Animoto, will enhance student understanding of characterization and empathy in *Roll of Thunder, Hear My Cry*. Through this teaching experiment, I discovered an answer to two guiding questions: How do students respond when Animoto is used as an application of dual-coding theory? Does creating an Animoto video lead students to experience empathy?

Life without the Internet can be difficult for 21st century adolescents to imagine. They live in what Henry Jenkins calls a participatory culture, a culture in which students enjoy using multimedia to create and pool knowledge (Jenkins, 2009). One study reveals that 75% of 16-24-year olds believe they could not live without the Internet, and 45% report feeling happiest when online (Walmsley, 2009). Adolescents are immersed in social networks and turn to the Internet when they need support; over 30% of young people report that they do not need to discuss their problems with people because they can find all the information they need online (Walmsley, 2009). The entire history of literacy has never seen anything like the explosion of the Internet; "no other technology for reading, writing, and communication has been adopted by so many people, in so many places, in so short a time" (Leu et al., 2007). All ethnicities report that they like using computers in class more than activities such as independent vs. group work, listening to a lecture, and independent research (Spires, Lee, Turner, & Johnson, 2008). Students in this study also rated online research as their second-favorite activity. Research shows that the Internet, along with proper technology, allows student to take control of their own learning.

Students are reading, playing, and learning on the Internet now more than ever; this led me to explore the impact of a new online tool in a sixth grade English language arts classroom through a mixed methods design (Creswell, 2007). Both quantitative and qualitative methods were used to determine whether or not dual coding (specifically through the use of Animoto) can help students demonstrate empathy. Twenty-first century learners must develop understandings that are quite different from those of the 20th century. Dan Pink argues that we must teach students to use the right sides of their brains more. The left, logical, linear side of our brains was ideal for 20th century workers, but now employers are looking for abilities such as holistic thinking, recognizing patterns, and interpreting emotional and nonverbal signals (Pink, 2005, p.14). Three key right-brain aptitudes are design, empathy, and play, which are emphasized in

the video below. A relatively new online tool such as Animoto enhances student understanding of characterization in *Roll of Thunder, Hear My Cry* by challenging students to utilize the right-brain skill of empathy while satisfying key Common Core standards. Through this teaching experiment, I discovered an answer to two guiding questions: How do students respond when Animoto is used as an application of dual-coding theory? Does creating an Animoto video lead students to experience empathy?

YouTube video segments of students using Animoto for this study can be found here.

Review of Literature

Dual-coding theory (DCT) suggests that learning occurs through one of two channels; the one that processes text or audio and the one that processes nonverbal images. When information is processed through both channels, this is called referential processing. Learning is generally richer when information is processed through both channels rather than just one (Clark and Paivio, 1991). Certain multimedia combinations help people learn different concepts; Bell & Johnson (cited in Najjar, 1996), for example, discovered that people tend to prefer words and images for loading a battery into a camera, for example, rather than just text. Some students learn better when words and images are used in lessons rather than text alone. Rosen, Fullwood, Henley & King (2012) found that students who listened to abstract words in context sentences while viewing pictures with embedded words learned more than those who simply read words in context sentences. One meta-analysis compared learning information presented in a typical classroom lecture with computer-based multimedia instruction across 200 studies. Students ranged from K-12 to higher education and the military, and they studied topics such as biology, foreign languages, and electronic equipment operation. More learning occurred when the information was presented through computer-based instruction rather than through traditional classroom lecture (Najjar, 1996). One learns more from a science textbook, for example, when text is presented next to illustrations, rather than when they are separate from each other (Mayer & Sims, 1994). Furthermore, students learn better when animations and narrations are presented simultaneously than when they are presented successively. For example, one experiment tested whether performance was enhanced when learning about the human respiratory system. Students who viewed the simultaneous narration and animation performed better than students who received successive presentation or no instruction (Mayer & Sims, 1994). Other research suggests that learning takes less time when multimedia is used; for example, one meta-analysis identified 13 studies in which students who used computer-based instruction for tutoring learned the material in 71% less time than in traditional classroom instruction (Najjar, 1996).

One area greatly impacted by DCT is distance education. Online nursing students, for instance, often find videos to be helpful when learning about proper procedures with patients. Hartland, Biddle, and Fallacaro (2008) had one group of students view two filmed vignettes and another group read two case reports about similar themes. Six months later, the students completed a questionnaire asking if they recalled themes, specific actions, whether their viewing/reading affected their practice, and whether their viewing/reading was a useful tool in the domain of patient care and safety. One hundred percent of participants who viewed the films recalled main themes, whereas only 9.5% of those who read the reports recalled key themes. Half of the respondents thought the films affected their practice, while only 12% of respondents

believed the reports affected their practice. The vicarious nature of the relevant video helps demonstrate real-world applications and heighten learner attention and interest (Hartland, Biddle, & Fallacaro, 2008). This study is similar to one conducted with fourth and sixth-graders regarding children remembering more from television news than from print news. Beacham, Elliot, Alty, & Al-Sharrah (2002) wanted to examine alternative explanations to dual-coding theory such as underutilization of the print medium, a recall advantage of listening compared with reading, and imperfect reading ability. After examining these alternative explanations, results supported the dual-coding hypothesis and no support was found for the alternative explanations.

Although educators have known about DCT for years, the business sector is just beginning to take advantage of the connection between DCT and instructional technology. Two entrepreneurs from New York wanted to offer a service that would provide a movie with user-selected photos and sound. The special part about their idea was the ability to send the film to loved ones. Rather than surrendering a large chunk of ownership to venture capitalists for the server space and bandwidth that this kind of enterprise would require, they decided to tap into cloud computing. Cloud computing allows one to rent computer equipment and an IT department. The major benefit of this was that the cloud computing service could scale up or down based on customer demand (Smith, 2009). Cloud computing was a key factor in the birth of Animoto. One of the entrepreneurs was Guy Jason, who got the vision for Animoto from working in the film and TV industry. He wanted to help bridge the gap between the "quality of content you see on the web and the type of stuff you see on TV and in film" (Jason, 2007). Jason also mentions the need for a tool that prevents people from sending friends slideshows with numerous photos.

Numerous tech-savvy educators seek to branch out and use assessment methods other than PowerPoint presentations that include links to videos and audio. This is where the idea of a "mash-up" tool comes in; this type of tool provides teachers with different presentation styles through information communication technology. The expression "mash-up" comes from the practice of combining two pieces of music to create a new song (McPherson, 2008). Animoto creates a video with dazzling special effects, but part of the beauty is its user-friendly format. There are four steps involved with creating a movie:
1. Drag and drop copyright-free images.
2. Arrange images and text.
3. Select the sound file.
4. Click the "Finalize" button.

One author writes that help with the site is not far away: her e-mails have always received a response within twelve hours. For many users, the most time-consuming component of Animoto is searching through personal photos and the Internet for "just right, copyright-free music and photography" (McPherson, 2008, p. 2).

Animoto can be used in many fun ways in the classroom. The tool leads to a great discussion on copyright, such as which images and songs are copyright-free and which are not. Another timely topic that Animoto supports is effective presentation posting practices. In an age when teenagers do not think twice about posting photos of themselves in swimsuits on Facebook, "Effective Posting Practices" is an imperative discussion for educators to have. Animoto

provides an excellent platform for displaying portfolios of learning, whether it takes place in Art, Literature, Social Studies, or other fields of study. Students could also use Animoto to present a topic that they research online, in the library, or on a field trip (McPherson, 2008). Other ideas for activities that utilize Animoto include: teachers showing a video on the first day of class to get students excited about the main topic; having students create a 30-second video about themselves at the beginning of the year so that everyone can get to know each other; having students create a simulated field trip; or having students create 30-second news briefs about historical news events, natural disasters, or any event that ties into curriculum.

The basic advantages of this tool include quick creation of powerful stories, engaging learners over long periods of time, and developing students' online social skills. The key disadvantages of the tool are that since it is Web-based, a slow Internet connection could create frustration for teachers; it is relatively new and therefore there has not been a great deal of research regarding the tool; and unlike Movie Maker or iMovie, users cannot fine-tune the presentation (McPherson, 2008). Some scholars argue that Animoto does not elicit a high degree of creativity, while others point out that that is not Animoto's purpose (Valenza, 2008). Other tools that require higher order thinking and design skills include Movie Maker and iMovie. The benefits of Animoto, along with its ease of use, make it a tool with which every educator should become familiar.
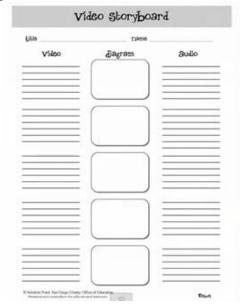
Task Design

The experiment was designed to teach students about racial injustice in *Roll of Thunder, Hear My Cry*. The teacher whose classroom served as a sample had previously taught a lesson about character development. This lesson gave students a chance to view the novel through the lens of their favorite character. At this time, students completed a worksheet on which they listed the qualities of the different characters in the novel. When I joined the classroom the next day, I had students complete a worksheet that asked each group of students to think of the main emotions their character experienced throughout the novel.

After reviewing the lesson with the students, I demonstrated how to use Animoto. Beforehand, I created distinct e-mail accounts with which each group logged in to Animoto. Next, students were instructed to create an introduction for an assigned character using Animoto. The class was divided into eight groups of three students each based on characters from the novel. The characters included Mama (Mary Logan), Big Ma (Caroline Logan), The Wallace

Family, Papa (David Logan), Christopher-John, Stacey Logan, Cassie Logan, and Little Man (Clayton Chester Logan). Before jumping into the video production, students had to complete a Video Storyboard on which they planned out their video.

Students had to select three photos, along with music, to be used for each video. This assignment involved substantial collaboration, as students had to not only agree on proper descriptions for their character, but also on which images and songs to use for their Animoto video.

Methods

Research questions were explored through a mixed method design (Creswell, 2007). SurveyMonkey, an online survey development tool, was used to collect survey responses from 27 sixth grade students. The survey was designed based on the Likert scale and also included open-ended questions.

Outcomes

Students completed a Likert scale survey so I could gather feedback about their Animoto experience. There were 27 students in the class and the respondent rate was 100%. Overall,

students report a positive experience with the Animoto website and would recommend it for their peers. One key issue that arose during this experiment was the lengthy wait time due to bandwidth speeds and all students creating a video at once.

Students greatly enjoyed the experiment with Animoto in their English class. Eighty-nine percent of students agreed that creating a video on Animoto helped them to understand the characters better than just reading about them, and the entire class agreed that Animoto is a fun website (see Table 1). Almost all (96%) students agreed that making the video helped them to think more deeply about their group's character from *Roll of Thunder, Hear My Cry*. This leads one to believe that using a tool such as Animoto can lead students toward a more empathic view of characters if it helps them to understand the characters better than simply reading about them in a printed novel. When a student has to consider if a certain image would describe the character, he or she must step into the character's shoes, so to speak. By taking on this narrative imagination, students develop their ability not only to be an intelligent reader of a character's story, but also their ability to be a "democratic and worldly citizen, one who understands the lives of others" (Wright, 2002, p. 1). Student responses support the notion of dual-coding theory which suggests that learning is generally richer when information is processed through both the channel which processes text or audio and the one that processes nonverbal images. It is not surprising that 92% of students would like their other teachers to use this website. Most of the class (93%) enjoyed working in groups while making the video.

Table 1. Animoto survey results

Statement	Percent in Agreement
Animoto helped me understand the characters better than just reading about them.	89%
Animoto is a fun website.	100%
Making the video helped me to think more deeply about my group's character.	96%
I would enjoy this website if teachers used it in other classes.	92%
I enjoyed working in groups while making the video.	93%

The qualitative section of the survey invited students to share the best and worst parts of Animoto based on their experience using the website. When asked what the best thing about Animoto was, students listed music selection. Their comments suggest that searching through different types of music was particularly fun: [I liked] "picking out the music," "the cool songs to choose from," and using "pictures and music instead of just imagining it." This response was expected based on personal observations, as students would nod their heads, tap their feet, and tell other students to listen to their song choice (see video above). This excitement was quite fun to watch, both for the teacher and for me. The next two best parts of using Animoto in students' eyes were the way the website worked so smoothly, and selecting the photos to use. Students also enjoyed delving into their character through images and musical selections; one student writes, "The best thing that Animoto was that you could tell everyone about [the] character in

more detail than just reading about [him or her]." Students also report that they enjoyed "learning about a new website and how to use it." This is important for teachers and students to consider, particularly when key facets of 21st century learning include media literacy, flexibility, and adaptability (Partnership for 21st Century Skills, 2013).

When asked what the worst thing about Animoto was, students reported the slow connection time, the need for more music options, and that they could only use three photos for the assignment. The wait time seemed to be more of an in-house issue with the school's wireless network than an issue with the actual website. Students were permitted to choose only three images for the assignment due to the amount of time I presumed students would need to create the video.

When asked if they had any other comments about their experience with Animoto, students expressed their enjoyment with the assignment: "I loved the pictures and the whole experience." They also recommend the website for use in other classes: "I want to say that it was a great thing and I hope that more kids that have not done Animoto can and they can see how much fun it is." Although the assignment was designed to instill perspective-taking regarding a literary character (which it did to an extent), it is interesting to note that the experience also led students to demonstrate empathy toward "more kids that have not done Animoto."

When previewing each video, students ensured that their final product elicited the feelings they would like their audience to experience. After viewing exemplars from the video above, one may experience various emotions. One exemplar (found at the end of the video above) was created by a group of young boys who were assigned the character of "Big Ma." They chose the song, "I will rise" by Chris Tomlin for their Big Ma music. They describe Big Ma as a "loving, caring person." Next, an image of the American flag appears which the group connects with "the independence of Big Ma." Toward the end of the video we see an image of a mountain lion, which symbolizes the "fearlessness of Big Ma."

This illustrates how the boys took on the perspective of Big Ma's character. The process of creating these videos helps students gain a sense of empathy for the characters in *Roll of Thunder, Hear My Cry.* It also illustrates the emotions a viewer of the video might experience. Some viewers, for example, may feel angry or sad after viewing the videos. When parents and educators view the video, they are led to a sense of empathy with the characters as well as the student/creator. This will depend on the type of music and images students choose to use in their videos. As students view the videos multiple times, they are better able to remember key literary themes long-term.

This activity can easily work as evidence of Common Core English language arts standards within the Reading: Literature strand. Three standards that are most supported by the Animoto activity include:

- CCSS.ELA-Literacy.RL.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- CCSS.ELA-Literacy.RL.6.3 Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves toward a resolution.
- CCSS.ELA-Literacy.RL.6.6 Explain how an author develops the point of view of the narrator or speaker in a text. (Common Core State Standards Initiative, 2012)

Each standard is reflected in the Animoto activity which involves having students think about the character, collaborate on the character's experience in the novel, and create an introduction for the character using digital images, music, and video. The sixth-graders were able to not only analyze "what the text says explicitly" about their assigned character, but also "inferences drawn from the text" (Common Core State Standards Initiative, 2012). The Animoto activity can be used as an effective way to support key Common Core standards as it leads students to analyze texts, describe how characters respond or change, and discuss point of view

Conclusion

After creating videos that involved not only an appreciation of the literature, but also students' empathic considerations, one may better understand how blending the subject matter

with Pink's suggested right-brain aptitudes is quite impactful. One would be hard-pressed to find a scholar who believes that learning should not be fun; by including creative visual and musical elements within one's teaching, students cannot help getting excited about literature. This study helped to solidify the belief that the more channels a learner uses to process information, the better he or she will learn. Students who used Animoto to express their take on the characters' thoughts and feelings in *Roll of Thunder, Hear My Cry* enjoyed the tool and thought it aided their understanding. The teacher was pleased that students enjoyed the activity while also satisfying Common Core standards. Developing this type of reader empathy is one of the key goals for which English language arts educators should aim.

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